SONY

CD-ROM INTERFACE CARD FOR IBM-PC/XT, AT

CDB-231

OPERATION MANUAL

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INFORMATION

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient the receiving antenna
Relocate the equipment with respect to the receiver
Move this equipment away from the receiver
Plug this equipment into a different outlet so that equipment and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful:
"How to Identify and Resolve Radio-TV Interference Problems". This booklet is available from the U.S. Government Printing Office, Washington, DC 20402, Stock No. 004-000-00345-4.

Connector cables for compliance with FCC Rules.
RK-B101 (Optional)

This apparatus complies with the Class B limits for radio noise emissions set out in Radio Interference Regulations.

Cet appareil est conforme aux normes Classe B, pour bruits radioélectriques. Tel que spécifier dans le Règlement sur le brouillage radioélectrique.

The CDB-231 is an interface card used when ›nnecting the Sony CD-ROM drive unit (such as DU-6100 series and CDU-510 series) to the ıM-PC/XT or AT*. It is inserted into the I/O ıannel connector in the IBM-PC.

Software (I/O drive software) for reading ›mmand transfer data according to the format ›ecified in the CD-ROM drive unit is required hen connecting the IBM-PC, CDB-231 and D-ROM drive unit in order to read the data in ıe CD-ROM disc. Refer to the drive unit's ›eration manual for detailed descriptions.

-1. Features

The main features of the CDB-231 are listed elow.

- Half-size printed circuit board.
- Base addresses for the I/O ports can be selected using DIP switches (A2 - A9).
- Both software read and DMA read type data read operations are possible.
- DMA channels can be selected using DIP switches (DRQ1, 2 or 3).
- Both polling and interrupt processing are available for drive status read operations.
- IRQ channels can be selected using DIP switches (IRQ2, 3, 4 or 5).
- DMA and IRQ channels can be enabled and disabled using software commands.
- The CDB-231 can be connected to both an internal drive and stand-alone drive.

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* The CDB-231 supports all IBM-PC/XT functions and most IBM-PC/AT functions.

1-2. Precautions

- Protect from static electricity
  Devices on the board can be destroyed by static electricity. Do not directly touch devices, leads, or terminals on the board.
- Protect from mechanical shock
  The set consists of electronic components having precise dimensions. Do not drop or bump the set.
- Turn off the power before connecting the set to peripherals.
  Connecting a set that is still on can sometimes damage it.

1-3. CD-ROM Drive DIP Switch

The CD-ROM drive DIP switch should be set as specified by the drive unit's operation manual.

For DRQ/WAIT selection of the drive, be sure to set the switch to DRQ unless your application software specifies.

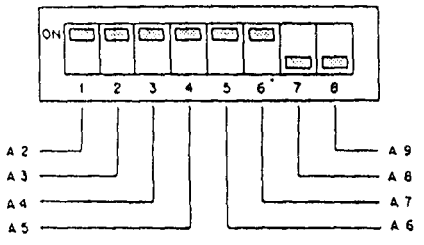
2. INPUT/OUTPUT PORTS

2-1. Selecting Base Addresses

The CDD-231 has seven types of I/O ports. These can be selected from the address buses (A0 - A9) of the IBM-PC.

Addresses A2 - A9 (base address) of A0 - A9 can be selected using the DIP switches on the CDD-231.

The I/O ports of the CDD-231 are selected by adding values A0 and A1 to the base address. When the unit is shipped from the factory, the base address is set to 300H. In this case, the I/O ports of the CDD-231 are selected using the four addresses 300H, 301H, 302H and 303H.



For each bit, ON = 0 and OFF = 1

Fig. 2-1 Base Address Select Switch (S1)

2-2. Functions of I/O Ports

The following is a description of the functions of I/O ports when 300H is selected as the base address, as shown in Fig. 2-1.

The input in this section refers to input to the IBM-PC and the output refers to output from the IBM-PC.

Table 2-1 Outline of Input/Output Port Function

Address	Port	I/O	Function
300H	Command	O	Commands written to the command port are transferred to the disk drive unit.
300H	Status	I	Drive status is read from the status port.
301H	Data	I	CD-ROM data is read from the data port.
302H	Flag	I	The DATA ENABLE and STATUS ENABLE signals of the disk drive unit are read from the lower two bits of the flag port.
303H	Mask	O	The lower two bits of the mask port can be used to select ENABLE/DISABLE for the DMA and IR
303H	Drive Select	O	The lower four bits of the drive select port can be used to select the drive number of the drive uni
303H	Software Reset	I	Drive is reset.

Note: The above definitions are valid when 300H is used as the base address for the port addresses.

(1) Command port (300H) — Output

Commands are transferred to the disk drive units by writing commands to the command port in the format specified by the drive unit. The disk drive unit receives commands at the positive edge of the IBM-PC's -IOW signal. Commands are written in single byte format. Refer to the disk drive unit's operation manual for details concerning protocol and timing.

(2) Status port (300H) — Input

The drive status can be read by inputting data from the status port data bus when the STATUS ENABLE bit of flag port (302H) is low.

I/O drive software allows reading of the STATUS ENABLE bit in either polling or interrupt format (refer to the sections on flag port and mask port).

(3) Data port (301H) — Input

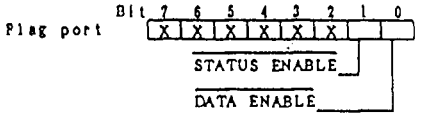
Performing data port input when the flag port's $\overline{\text{DATA ENABLE}}$ bit is low and the DRQ/$\overline{\text{WAIT}}$ is high allows reading of CD-ROM data in single byte units.

Either 2048 or 2340 bytes can be selected as the data length for one block (refer to the section on drive mode in the disk drive unit's operation manual).

I/O drive software allows data read in either the software read or DMA read formats

(4) Flag port (302H) — Input

The lower two bits of the flag port's data bus are assigned as the $\overline{\text{DATA ENABLE}}$ and $\overline{\text{STATUS}}$ ENABLE signals.



$\overline{\text{DATA ENABLE}}$:

A low bit 0 in the flag port indicates that the disk drive unit is ready for data transfer.

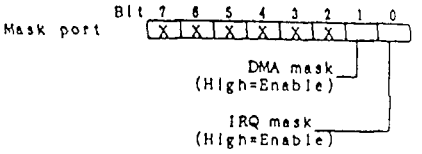
$\overline{\text{STATUS ENABLE}}$:

A low bit 1 in the flag port indicates that the disk drive unit is ready to transfer drive status.

DMA data transfer and drive status interrupt processing are possible when both the DMA mask bit and the IRQ mask bit of the mask port are set to high.

(5) Mask port (302H) — Output

The lower two bits of the data bus output to the mask port select ENABLE/$\overline{\text{DISABLE}}$ for the IRQ and DMA.



(6) Drive select port (303H) — Output

The lower four bits of data output to the drive select port select the drive number.

The drive numbers and their corresponding lower four bits of output data are shown in the table below.

3	2	1	0	Driver number
1	1	1	0	0
1	1	0	1	1
1	0	1	1	2
0	1	1	1	3

(7) Software reset port (303H) — Input

When data at the software reset port is input (read), all drives connected to the CDB-231 are reset. The drive is initialized during software reset operation. At that time, the CDB-231 remains unchanged without being reset.

Note: Address 303H is used in common for the drive select port (output) and software reset port (input). Therefore, the input and output should be distinguished accurately when this port is accessed.

3. CONNECTOR

2-3. Selecting IRQ and DMA Channels

The IRQ and DMA channels on the IDM-PC can be selected using DIP switches when status read is performed in the interrupt format or data is transferred in the DMA format. Switch S2 selects the IRQ channel and switch S3 selects the DMA channel.

When the unit is shipped from the factory, the select switches of this card are set to IRQ3 and DRQ3.

These switches are invalid when the IRQ and DMA are disabled at the mask port.

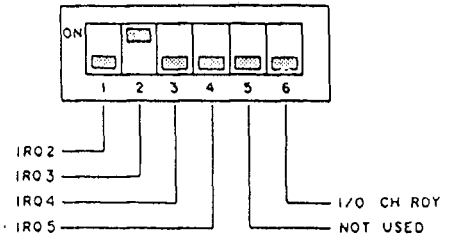


Fig. 2-2 IRQ Channel Select Switch (S2)

When bit 6 is set to ON, the drive unit's DRQ/WAIT signal can be read from I/O CH RDY.

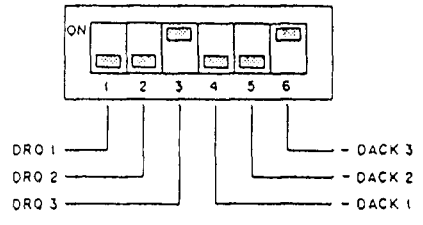


Fig. 2-3 DMA Channel Select Switch (S3)

3-1. I/O Channel

The I/O channel is inserted into an IDM-PC's I/O channel connector.

The pin assignment conforms to the I/O channel specifications of the IDM-PC/XT or AT.

Pin No.	Signal	Pin No.	Signal
B1	GND	A1	-I/O CH CK
B2	RESET DRV	A2	D7
B3	+5V	A3	D6
B4	IRQ2	A4	D5
B5	-5VDC	A5	D4
B6	DRQ2	A6	D3
B7	-12V	A7	D2
B8	-CARD SLCTD	A8	D1
B9	+12V	A9	D0
B10	GND	A10	I/O CH RDY
B11	-MEMW	A11	AEN
B12	-MEMR	A12	A19
B13	-IOW	A13	A18
B14	-IOR	A14	A17
B15	-DACK3	A15	A16
B16	DRQ3	A16	A15
B17	-DACK1	A17	A14
B18	DRQ1	A18	A13
B19	-DACK0	A19	A12
B20	CLK	A20	A11
B21	IRQ7	A21	A10
B22	IRQ6	A22	A9
B23	IRQ5	A23	A8
B24	IRQ4	A24	A7
B25	IRQ3	A25	A6
B26	-DACK2	A26	A5
B27	T/C	A27	A4
B28	ALE	A28	A3
B29	+5V	A29	A2
B30	OSC	A30	A1
B31	GND	A31	A0

3-2. CD-ROM Drive Interface Connector

(#3595-5002SC 3M or equivalent for internal)

(#10240-5202JL 3M or equivalent for external)

The CD-ROM drive interface connector is connected to a CDU-6100 series using an RK-B101 (optional) or connected to a CDU-510 series using an RK-B70F (optional).

The pin assignment conforms to the CDU-6100/510 series host interface specifications.

Signal	I/O	Pin No.
DATA 0	I/O	2
1	I/O	4
2	I/O	6
3	I/O	8
4	I/O	10
5	I/O	12
6	I/O	14
7	I/O	16
ERROR FLAG	O	18
$\overline{\text{STATUS ENABLE}}$	O	20
$\overline{\text{DATA ENABLE}}$	O	22
DRQ/$\overline{\text{WAIT}}$	O	24
DATA/$\overline{\text{COMMAND}}$ & $\overline{\text{STATUS}}$	I	26
$\overline{\text{READ}}$	I	28
$\overline{\text{COMMAND WRITE}}$	I	30
$\overline{\text{DRIVE SELECT}}$ 0	I	32
1	I	34
2	I	36
3	I	38
$\overline{\text{RESET}}$	I	40

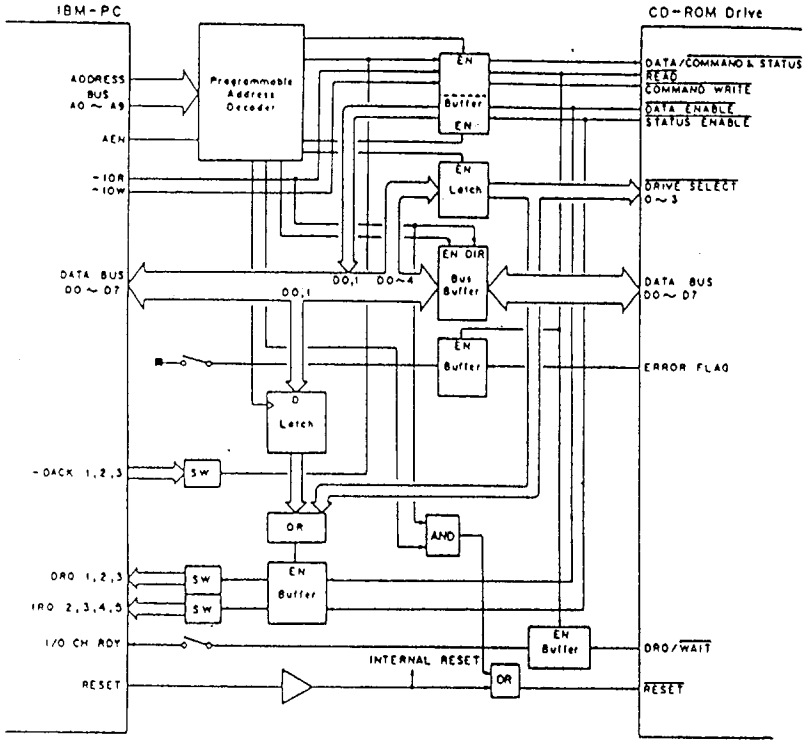
Notes:

1. All odd pins are ground lines.
2. I: Input to the drive
   O: Output from the drive

Dimensions	130 x 25 x 150mm (w x h x d) (5 1/8 x 1 x 6")
Weight	100g (4 oz)
Operating temperature	5° to 45°C (41 to 113 F)
Operating humidity	30 to 60%
Storage temperature	-30° to 60°C (-22° to 140°F)
Supply voltage	+5V ±5%
DC current required	270mA
Accessories	Operation manual (1)
Optional accessories	RK-B101 connector cable (for stand-alone drive) RK-B70F (70cm) RK-B20F (20cm) connector cable (for internal drive)

5-1. Interface Circuit Configuration

The interface circuit configuration is as follows:

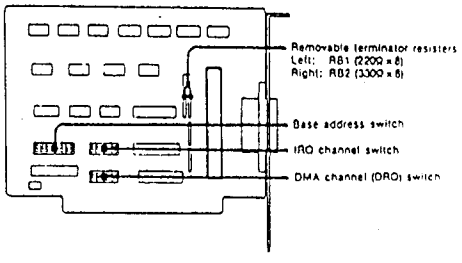


5-2. Location

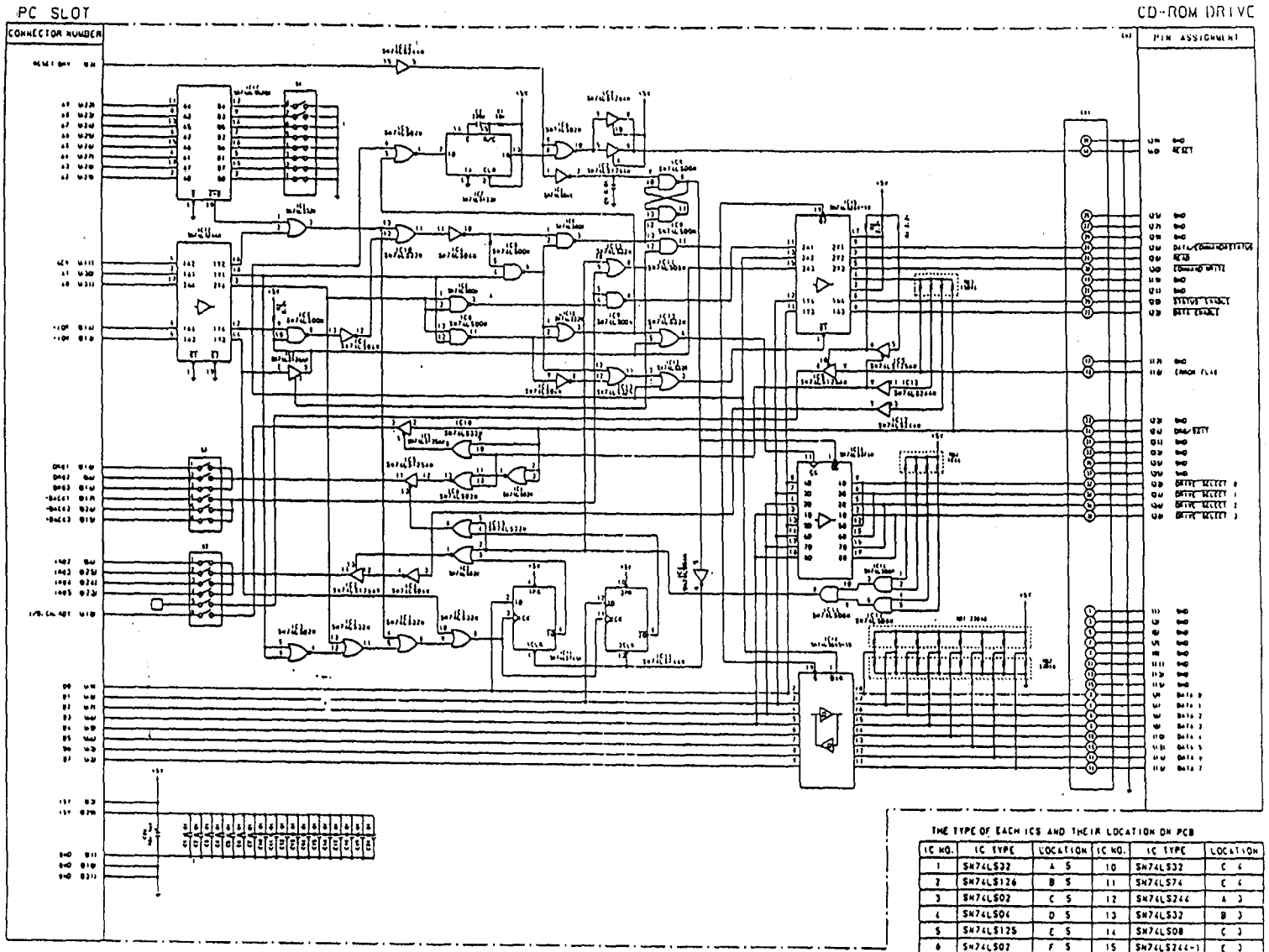
Note for terminator resisters

When you connect CD-ROM drive unit to a host computer with an internal CD-ROM drive, remove these terminator resisters from the sockets.

Keep the terminator resisters for future use.



5-3. Schematic Diagram



THE TYPE OF EACH ICS AND THEIR LOCATION ON PCB

IC NO.	IC TYPE	LOCATION	IC NO.	IC TYPE	LOCATION
1	SN74LS32	A 5	10	SN74LS32	C 4
2	SN74LS126	B 5	11	SN74LS74	C 4
3	SN74LS02	C 5	12	SN74LS244	A 3
4	SN74LS04	D 5	13	SN74LS32	B 3
5	SN74LS125	E 5	14	SN74LS08	C 3
6	SN74LS07	F 5	15	SN74LS244-1	E 3
7	SN74LS123	G 5	16	SN74LS374	E 2
8	SN74LS00	A 4	17	SN74ALS520	A 1
9	SN74LS00	B 4	18	SN74LS645-1	E 1

6. EXAMPLE OF DIP SWITCH SETTING

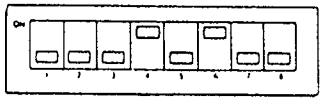
6-1. Base Address

If you plan to use another base address, change the switch setting as shown below. You may select any modulo four number between 300h and 3FCh.

The first two digits are determined by switches 3 to 8. The last digit is determined by switches 1 and 2.

Switch / Digit	1	2	3	4	5	6	7	8
30—	—	—	ON	ON	ON	ON	OFF	OFF
31—	—	—	OFF	ON	ON	ON	OFF	OFF
32—	—	—	ON	OFF	ON	ON	OFF	OFF
33—	—	—	OFF	OFF	ON	ON	OFF	OFF
34—	—	—	ON	ON	OFF	ON	OFF	OFF
35—	—	—	OFF	ON	OFF	ON	OFF	OFF
36—	—	—	ON	OFF	OFF	ON	OFF	OFF
37—	—	—	OFF	OFF	OFF	ON	OFF	OFF
38—	—	—	ON	ON	ON	OFF	OFF	OFF
39—	—	—	OFF	ON	ON	OFF	OFF	OFF
3A—	—	—	ON	OFF	ON	OFF	OFF	OFF
3B—	—	—	OFF	OFF	ON	OFF	OFF	OFF
3C—	—	—	ON	ON	OFF	OFF	OFF	OFF
3D—	—	—	OFF	ON	OFF	OFF	OFF	OFF
3E—	—	—	ON	OFF	OFF	OFF	OFF	OFF
3F—	—	—	OFF	OFF	OFF	OFF	OFF	OFF
	and							
—0h	ON	ON	—	—	—	—	—	—
—4h	OFF	ON	—	—	—	—	—	—
—8h	ON	OFF	—	—	—	—	—	—
—Ch	OFF	OFF	—	—	—	—	—	—

For example, to select 35Ch, set switches 3 to 8 for 35—, and switches 1 and 2 for —Ch.

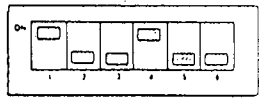


6-2. DMA Channel (DRQ)

If you plan to use another DMA cha (DRQ), change the switch setting as shown belo

Switch / DRQ	1	2	3	4	5	6
DRQ1	ON	OFF	OFF	ON	OFF	OFF
DRQ2	OFF	ON	OFF	OFF	ON	OFF
DRQ3	OFF	OFF	ON	OFF	OFF	ON

For example, to select DRQ1, set the sw as follows.

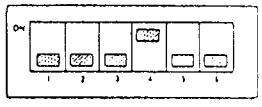


6-3. IRQ Channel

If you plan to use another IRQ char change the switch setting as shown belo

Switch / IRQ	1	2	3	4
IRQ2	ON	OFF	OFF	OFF
IRQ3	OFF	ON	OFF	OFF
IRQ4	OFF	OFF	ON	OFF
IRQ5	OFF	OFF	OFF	ON

For example, to select IRQ5, set the sw as follows.

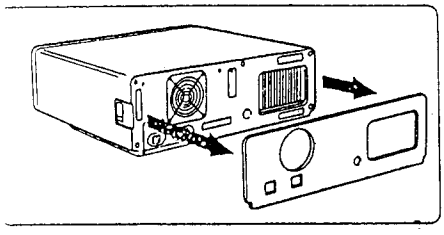


1. Installing the Host Adapter into the Computer

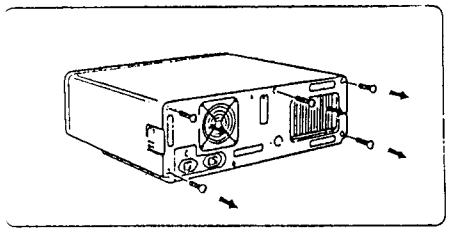
Disconnect the power cable of the computer om the AC outlet and disconnect the cables tached to the back of the computer to give urself more room to work.

Make sure not to turn on the power of e computer before installations of the host dapter completes.

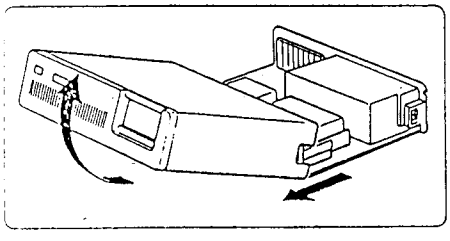
Your computer may have its rear side covered by a plastic panel attached with plastic fastener strips. Pull the panel off.



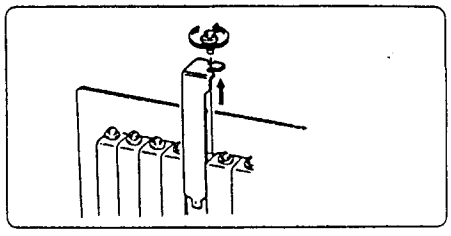
. Remove the cover mounting screws — all of which are at the back of the computer.



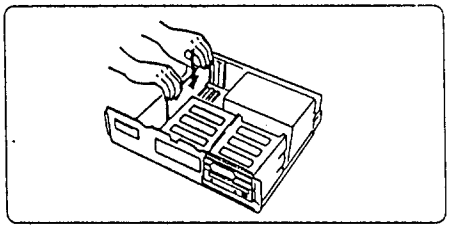
. Remove the cover of the computer.



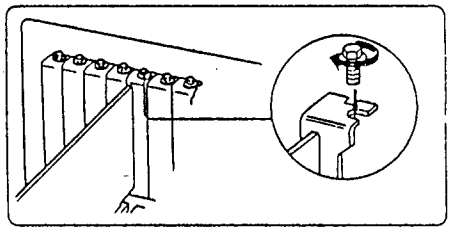
4. Remove the cover of an empty expansion slot.



5. Hold the host adapter by its top corners, slide it into the support bracket, and press it firmly into the expansion slot at the bottom.



6. Secure the host adapter with the screw you removed in step 4.



7. Slide the host computer's cover on and fasten the cover mounting screws at the back of the unit.

8. Remount the rear plastic panel if your computer has one.